

A new catfish from Sierra Leone

Gordon Jon Howes

Zoology Department, British Museum (Natural History), Cromwell Road, London SW7 5BD

A collection of freshwater fishes from Sierra Leone made by Dr A. I. Payne contained three specimens of a previously undescribed dwarf catfish. At first sight these small fishes (33.5–36 mm SL) were thought to be the juveniles of a *Synodontis* species, but closer examination showed many significant differences. Furthermore, dissection of two specimens revealed that they were adult females, having ripe ovaries. In overall morphology the new catfish appears closer to members of the Mochokidae *sensu lato* than to those of any other siluroid family, (see p. 168). The possibility that these fishes belonged to the dwarf mochokid genus *Microsynodontis* was dispelled when comparisons were made with species of that genus.

MOCHOKIELLA gen. nov.

Fishes of a small size with a shallow body (depth 25.5–27.9 of SL). Head broad (almost equal to its length) with dorsal profile sloped, snout rounded, ethmoid with narrow rostral process. Nostrils widely separated, the posterior situated midway between the anterior nostril and the orbital rim. Anterior nostril tubular. Mouth small, lower lip developed only at the corners of the mouth. Premaxillary teeth short and conical, in a broad patch. Dentary teeth like those on the premaxilla, set in a broad semi-crescentic band. Vomerine teeth absent. One pair of maxillary and two pairs of mandibular barbels. The maxillary barbel long, reaching to the tip of the cleithral process. Outer mandibular barbel extending to halfway along the cleithral process, the inner reaching to the base of the pectoral spine. The outer barbel bears 3 long branches, or sub-barbels, and the inner has 4 (number constant in all specimens). The nuchal shield is well-developed, slightly rugose. There are 3 nuchal plates, the 3rd paired, divided by the 1st and 2nd dorsal fin spines. The cleithral process is narrowly triangular, extending to a line level with the edge of the 3rd nuchal plate.

Eye supero-lateral without free orbital rim. Pectoral spine strong, almost reaching the origin of the pelvic fin, its anterior margin bears 23 serrations, the posterior margin 8–9 strong 'teeth'. The longest ray of the pelvic fin reaches to the origin of the anal fin. Anal fin base short, as long as the caudal peduncle. Adipose fin deep and long based, equal to its distance from the last dorsal fin ray. Caudal fin long and forked. Branchiostegal rays 6. Gill opening extending to the base of the pectoral fin spine; branchiostegal membrane forming a fold across the ventral surface of the head. Gill-rakers small, 6 on 1st ceratobranchial. Lateral line pores prominent, interrupted.

Mochokiella is distinguished from all other African siluroids by a combination of characters including small adult size, uni-lateral branching of the mandibular barbels, supero-lateral position of the eye, bands of villiform jaw teeth, elongate humeral process, paired 3rd nuchal plate and distinctive colouration (see below).

Type species: *Mochokiella paynei* sp. nov
(Fig. 1)

HOLOTYPE. An adult female, 33.5 mm SL BMNH 1979.8.22:1 collected from Kassawe Forest Reserve, Sierra Leone by Dr A. I. Payne, for whom the species is named.

DESCRIPTION. Based on the holotype and two paratypes, BMNH 1979.8.22:2–3, 35.5 & 36 mm SL. Characters given here amplify the preceding generic description. The proportions given below are shown as percentages of the standard length except for nos

	Holotype 1979.8.22 : 1	Paratypes 1979.8.22 : 2-3	
Standard length	33.5 mm	35.5 mm	36 mm
Depth	27.0	25.5	27.9
Head length	31.5	31.5	29.2
Interorbital width	38.0	40.0	38.0
Snout – dorsal fin	39.0	39.5	39.0
Eye diam.	19.0	22.5	24.0
Mouth width	27.0	28.5	28.5
Head width	30.0	31.0	29.2
Snout length	38.0	40.0	43.0
Maxillary barbel	132.0	130.0	119.0
Mandibular barbel, outer	105.0	112.0	105.0
Mandibular barbel, inner	76.0	71.0	67.0
Cleithral process length	15.4	18.4	19.4
Cleithral process depth	28.2	31.0	23.0
Pectoral spine length	27.0	24.0	27.9
Pelvic spine length	12.0	12.6	12.5
Dorsal spine length	22.5	22.5	22.1
Dorsal – adipose distance	26.9	34.2	22.1
Adipose fin length	26.9	24.0	19.4
Caudal peduncle length	13.4	15.5	11.1
Caudal peduncle depth	12.0	11.3	9.7
Anal fin base length	14.0	12.7	16.6
Dorsal fin rays	II6	II6	II6
Pectoral fin rays	I6	I6	I6
Pelvic fin rays	I6	I6	I6
Anal fin rays	II0	I9	II0
Gill-rakers on lower arch	6	Unknown	Unknown
Vertebrae excluding fused anterior elements	27	27	27

3,5,6,8–11, which are percentages of the head length; the depth of the cleithral process (13) is shown as a percentage of its length (12).

COLORATION. The overall body colour pattern is mottled, the top of the head dark with indistinct transverse bands. A dark band links the nostrils to the eye and a diffuse band runs antero-ventrally from the eye to the mouth. A light stripe crosses the interorbital space. The cheeks and operculum bear dark patches. A distinct dark band runs across the supraoccipital, and is followed by a broad light patch and then another dark band on each 3rd nuchal plate, which are divided by the dorsal fin. From the base of the dorsal fin to the mid-lateral line is an area of dark brown pigment. Below the cleithral process this pigment is broken into a reticulated pattern. Just above the pelvic fin is a dark, irregular patch encircled by a light band. An extension of this band continues dorsad to meet its partner and form a light area anterior to the adipose fin. In the paratypes the mid-lateral blotch is much less distinct than in the holotype, the encircling band being broken and interrupted mid-dorsally. From the rear of the adipose fin a broad light stripe runs down to the posterior part of the anal fin. The dorsal part of the caudal peduncle is uniformly dark; below the lateral line is a lighter coloured spot just posterior to the anal fin, followed by a darker patch at the base of the caudal fin. Again, on the paratypes these markings are less distinct and more reticulated. In all specimens the ventral surface of the body is mottled with light brown pigment, a small darker patch occurs at the base of each pelvic fin.

The adipose fin is mostly dark, but with a light posterior margin. In one of the paratypes the posterior tip has a distinct spot, and in the other there are two spots. All other fins are barred and blotched. All barbels are barred.

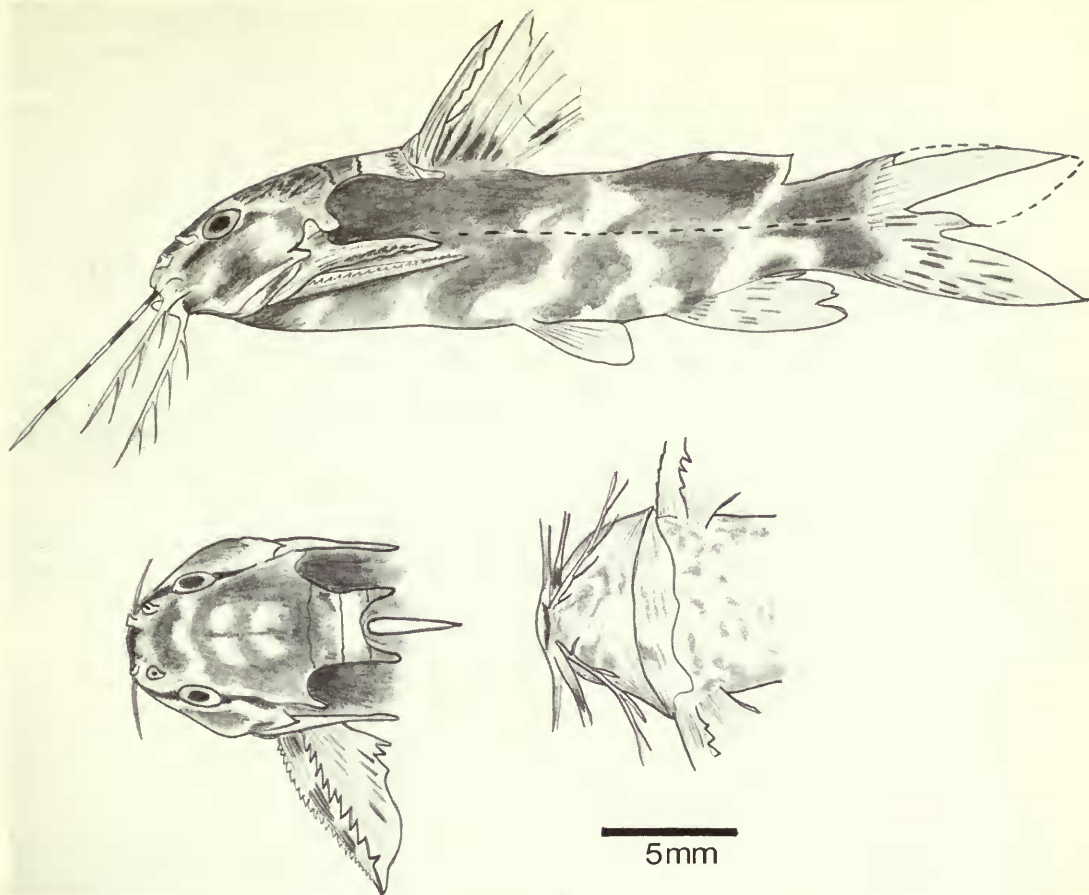


Fig. 1 *Mochokiella paynei*; above, lateral view; below, dorsal and ventral views of the head.

Life colours have been recorded from 6 imported aquarium specimens: The light areas are cream to beige and the dark areas Vandyke Brown. The markings on the head are more distinctive and appear as individual blotches and spots. The patterning differed little from that of the types, most noticeable was the variation in the markings of the adipose fin. However, the main features – the pale nuchal band, striped snout, mid-lateral reticulation and caudal peduncle band were well-developed.

HABITAT AND HABITS. The type locality is a forest stream in Kassewe Forest Reserve with a pH of 6.6. The fish were caught overnight in a baited trap.

Recent trade aquarium imports from Sierra Leone have included specimens of *Mochokiella paynei*, and six individuals have been observed in aquaria. The fishes readily seek shelter in cavities provided by rocks and wood; sometimes swimming vertically or upside-down against the cavity walls. They are most active at night, moving outside their hiding places. One fish was seen resting along an almost upright plant stem, supported by its caudal fin. All known aquarium specimens have been of the same or slightly larger size than the type series. Of the type specimens, two have ovaries each containing a total of c. 30 eggs.

PHYLOGENETIC RELATIONSHIPS. Both the lack of osteological material of *Mochokiella* and knowledge of the distribution of certain anatomical characters throughout the Siluroidei makes any judgement of the taxon's relationships highly speculative.

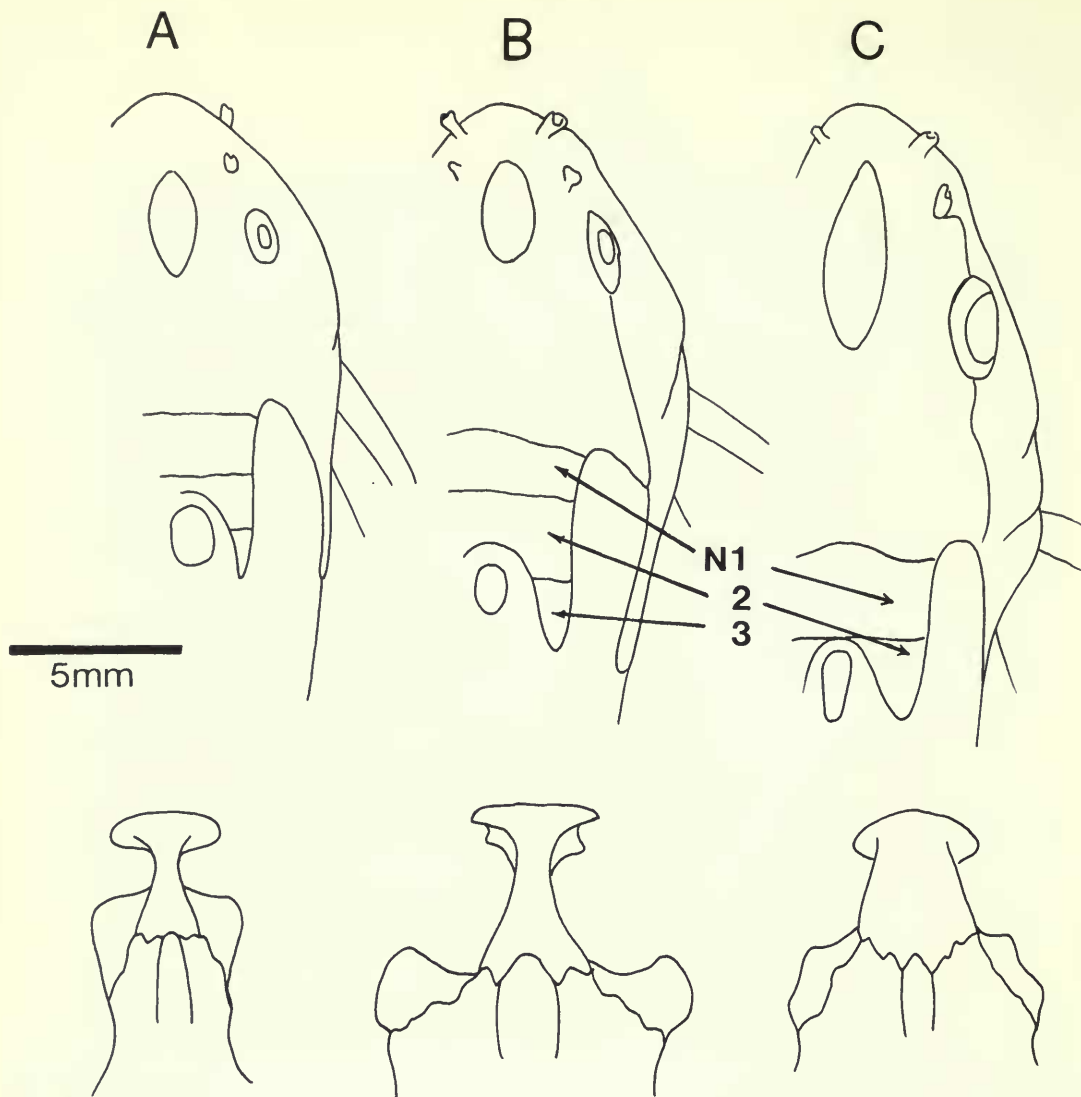


Fig. 2 Dorsal views of the heads and ethmoid regions of A. *microsynodontis batesii*, B. *Mochokiella paynei*, C. *Synodontis melanopterus*. All specimens are of the same size, 36 mm SL. N1, 2 & 3 = nuchal plates.

Assignment to the Mochokidae is made solely on the grounds of superficial resemblance and must be viewed as a temporary expedient (see below). Character comparison of *Mochokiella* with *Microsynodontis* and *Synodontis* is given below and in Fig. 2.

On the basis of more numerous similarities, *Mochokiella* more closely resembles *Microsynodontis* than any other mochokid. Present lack of data makes it impossible to say whether these similarities are to be regarded as based on apomorph or plesiomorph features. The ethmoid of both *Mochokiella* and *Microsynodontis* is long and narrow, in contrast to the broad, thick ethmoid of other mochokids (Figs 2A & B), the only exception being *Mochokus*. A similarly elongate ethmoid occurs in some bagrids, e.g. *Chrysichthys* and *Auchenoglanis*. Research on other otophysans – characoids and cyprinoids – has indicated that an elongate ethmoid is an apomorph character. However, it should be noted that an elongate ethmoid is present in *Diplomystes*, considered by some authors as a primitive siluroid (Regan, 1911;

Alexander, 1966). *Mochokiella* shares with *Microsynodontis* and *Mochokus* two other features. One is the elongate posterior cleithral process (humeral process) which is short and broadly triangular in other mochokids and bagrids. The other character is the number and form of the nuchal plates, there being 3 in all three genera, the 2nd partially divided by the dorsal fin spine and the 3rd completely divided. In other mochokids and amphiliids there are two nuchal plates (see Taverne & Aloulou-Triki, 1974). *Mochokiella* has the parapophyses of the 4th and 5th vertebrae well-developed, spine-like and extended laterally as in *Synodontis*. In *Mochokus* these parapophyses extend upward to contact the ventral surface of the nuchal plates and in *Microsynodontis* they contact each other laterally to form a continuous shelf – similar to that illustrated for *Pimelodus* by Alexander (1966).

The dentition of *Mochokiella* is distinctly different from that of other mochokids, and it more closely resembles that of bagrids. However, this is most likely to be a plesiomorph rather than an apomorph character.

Mochokiella differs from other species of *Microsynodontis* in having greater body depth, longer head, greater interorbital width, longer snout to dorsal distance, larger eye, longer mandibular barbels, longer dorsal and pectoral spines and caudal fin forked instead of rounded.

	<i>Mochokiella</i>	<i>Microsynodontis</i>	<i>Synodontis</i>
Nuchal plates	3	3	3
Ethmoid	elongate	elongate	short and broad
Eyes	small, superolateral; no free orbital rim	Minute, superior; no free orbital rim	large, lateral or supero-lateral; free orbital rim
Lower lip	weak	well-developed	usually well- developed
Dentary teeth	small, conical, all of equal size set in broad band	slender, hook-like, the outer row longer than the inner, set in narrow band	elongate, hook- like, outer row longer than the inner, set in small, rounded patch
Premaxillary teeth	small, conical, all of equal size set in broad patch c.45 on each pmx.	slender, elongate set in broad patch c. 45–50	stout, elongate set in narrow band, c. 30
Mandibular barbels	with thin sub-barbels	with thick sub-barbels	with numerous sub- barbels sometimes tuberculate
Gill opening	extending anterior to pectoral base	to pectoral base	to pectoral base
Branchiostegal membrane	transverse ventral fold	transverse fold	fold lacking
Pectoral fin spine	anterior serrations, 25–26	28	28–29
Lateral line	interrupted	interrupted	complete
Adipose fin	long	short	variable
Cleithral process	elongate	elongate	broadly triangular
Caudal fin	forked	rounded	forked

As currently recognized, the Mochokidae contains the genera *Mochokus*, *Microsynodontis*, *Atopocheilus*, *Acanthocleithrum*, *Chiloglanis*, *Euchilichthys*, *Synodontis*, *Hemimicrosynodontis* and *Brachysynodontis*. Taverne & Aloulou-Triki (1974) recognized the diverse nature of this family by placing the latter three genera into the subfamily Simuldentinae. Although these authors listed a set of characters defining the subfamily, no comparison was made with the other non-included genera nor with other siluroids. Thus, the

distribution of these characters within the suborder is unknown. From preliminary observations of the osteology of the Mochokidae I would venture to suggest that the family is possibly polyphyletic.

Acknowledgements

My most sincere thanks are due to Dr A. I. Payne for collecting the catfishes and providing habitat information, and to Stephen Pritchard who first drew my attention to aquarium imports and provided not only data on the habits of live fishes but with the singular osteological preparation of the species. I am most grateful also to Mr & Mrs D. Lambourne for their notes on live specimens.

I am indebted to Dr Max Poll, formerly of the Musée Royal de l'Afrique Centrale, Tervuren for loaning the holotype of *Microsynodontis polli* and to Dr P. H. Greenwood for commenting on the manuscript.

References

- Alexander, R. McN. 1966. Structure and function in the catfish. *Proc. Zool. Soc. Lond.*, **148** (1): 88-148.
- Regan, C. T. 1911. The classification of the teleostean fishes of the order Ostariophysi. 2. Siluroidea. *Ann. Mag. nat. Hist.* (8) **8**: 553-577.
- Taverne, L. & Aloulou-Triki, A. 1974. Étude anatomique, myologique et osteologique du genre *Synodontis* Cuvier (Pisces: Siluriformes, Mochochidae) *Annls Mus. r. Afr. cent.* **210**: 1-69.